Urgences Vitales chez la Femme Enceinte
Quels médicaments peut on utiliser ?
SRLF 2012

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Clinical review: Special populations - critical illness and pregnancy

Neligan and Laffey *Critical Care* 2011, **15**:227



Diagnostics/pathologie responsables d'admissions en réanimation
Pathologies directement liées à la grossesse - Hémorragies du péripartum - Prééclampsie/Eclampsie/Hellp syndrome - Stéatose aiguë gravidique (SHAG) - Cardiomyopathie du péripartum - Sepsis/choc septique d'origine obstétrical (Chorioamniotite, endométrite) - Syndrome d'Embolie Amniotique
Pathologies péexistante aggravées/décompensées par la grossesse - Neurologique: Epillepsie, myasthénie - Cardiovasculaire: Valvulopathie, HTAP, cardiopathie congénitale, cardiopathie ischémique - Endocrinienne: DNID, DID/acidocétose, insuffisance surrénale - Insuffisance rénale chronique/aiguë
Pathologie pour lesquelles la grossesse représente un facteur de risque - Sepsis: Pyélonéphrite, listériose, pneumopathie, pnumopathies d'inhalation - Endocrinienne: Acidocétose, Sheehan - TVP, Thrombophlébite cérébrale, Embolie pulmonaire - CIVD, Fibrinolyse aiguë
Pathologies sans rapport avec la grossesse - Polytraumatisme - Hémorragie méningée, autre AVC - Urgences chirurgicales

Profile of women admitted at an obstetric ICU due to non-obstetric causes

Marta de Andrade Lima Coêlho[1], Leila Katz[2], Isabela Coutinho[3], Aline Hofmann[4], Larissa Miranda[5], Melania Amorim[6]

Table 2 – Main clinical diagnoses that caused hospitalization of the women admitted during the pregnancy-puerperal cycle due to non-obstetric causes at the Obstetric ICU from January 01, 2005 to October 31, 2010 (n = 500), Recife – PE, Brazil, 2010

Main clinical diagnoses that caused ICU admission	n	%
Heart disease	88	17.6
DVT	55	11.0
Urinary sepsis	39	7.8
Severe asthma	39	7.8
APE	30	6.0
CAP	30	6.0
Epilepsy	20	4.0
Hospital pneumonia	18	3.6
Diabetic ketoacidosis	15	3.0
Others	166	33.2
Total	500	100

ICU, intensive care unit; IMIP, Instituto de Medicina Integral Prof. Fernando Figueira; APE, acute pulmonary edema; DVT, deep venous thrombosis; CAP, community-acquired pneumonia.

Cardiaque
TVP/EP

Rev Assoc Med Bras 2011; 58(2):160-167

Quelques principes



- Barrière placentaire => Echangeur placentaire
  - Presque tous les médicaments passent le placenta
  - Gros PM ne passent pas (Insuline, héparine)
- Population générale:
  - 2 à 3% de malformations congénitales
  - Moins de 5% (à,15% du total) liés à un médicament
- Pas de certitude malformative +++
  - Roaccutane ®, Thalidomide: 20 à 30% de malformations
- Risque d'interruption thérapeutique
  - Risque de sevrage thérapeutique > risque lié au médicament (EME)
  - Patientes enceinte sous traitées
- ITG pour cause médicamenteuse exceptionnel

Tératogénèse / Toxicité



- Tout début de grossesse (avant la fin de l'implantation: 12eme jour post conceptionnel)
  - Loi du tout ou rien (pour les radiations ionisantes)
  - Peu d'échanges materno-foetaux
  - Peu ou pas d'effet ses médicaments
  - Tenir compte de la demi vie
- Période embryonnaire (13eme au 56eme jour post conceptionnel)
  - Premier trimestre = organogénèse
  - Risque tératogène
  - Période dangereuse selon le type de malformation
- Période fœtale
  - Maturation des organes
  - Risque de toxicité assez proche des effets secondaires retrouvés chez l'adulte

Asthma and Pregnancy

Rani Reddy Vatti · Suzanne S. Teuber

Table 1 Normal arterial blood gas values in nonpregnant and pregnant women [10]

	pH	pO_2 (mmHg)	pCO_2 (mmHg)
Nonpregnant women	7.4	91–95	36–39.4
Pregnant women	7.4–7.45	106–110	28–32

Clinic Rev Allerg Immunol 2011

Asthma and Pregnancy

Rani Reddy Vatti • Suzanne S. Teuber

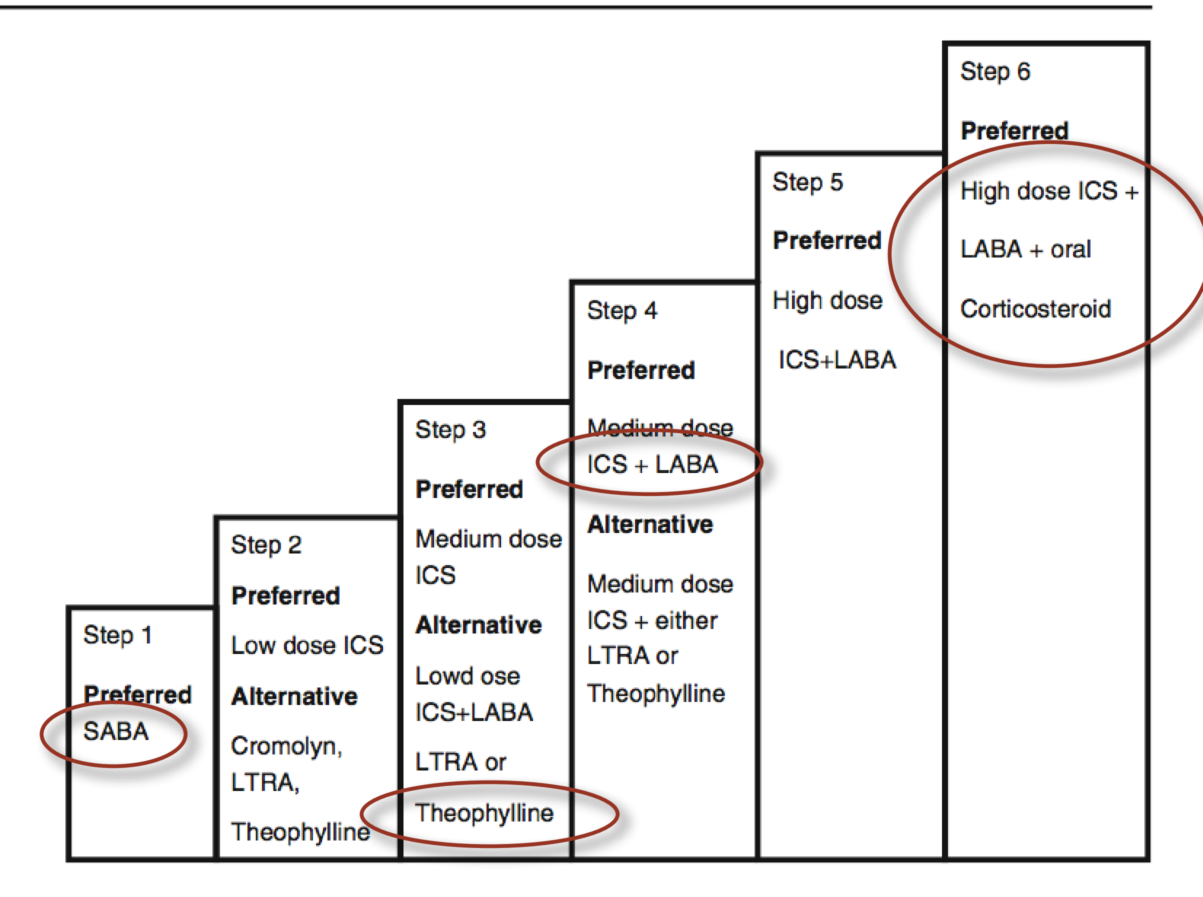


Fig. 1 Stepwise approach for managing asthma in pregnant women *SABA* short acting beta agonist; *ICS* inhaled corticosteroid; *LABA* long acting beta agonist, *LTRA* Leukotriene receptor antagonist Data adopted and modified from National Heart, Lung and Blood institute, National Asthma Education and Prevention Program. Expert panel report 3 Guidelines for the diagnosis and management of asthma 2007 update [1].

Clinic Rev Allerg Immunol 2011

Arrêt cardio-respiratoire

EPIDEMIOLOGIE
2003-2005

- Mortalité: 14/100 000 grossesse
- 8 ACR
- 1 / 20 000
- Survie 7%
- Pronostic fœtal lié au pronostic maternel
- Particularités de la femme enceinte







Part 12: Cardiac Arrest in Special Situations : 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

Maternal Cardiac Arrest

First Responder

- Activate maternal cardiac arrest team
- Document time of onset of maternal cardiac arrest
- Place the patient supine
- Start chest compressions as per BLS algorithm; place hands slightly higher on sternum than usual

Circulation 2010





Part 12: Cardiac Arrest in Special Situations : 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

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MCE:
Même rythme
Plus haut sur le sternum



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Subsequent Responders

Maternal Interventions

Treat per BLS and ACLS Algorithms

- Do not delay defibrillation
- Give typical ACLS drugs and doses
- Ventilate with 100% oxygen
- Monitor waveform capnography and CPR quality
- Provide post–cardiac arrest care as appropriate

Maternal Modifications

- Start IV above the diaphragm
- Assess for hypovolemia and give fluid bolus when required
- Anticipate difficult airway; experienced provider preferred for advanced airway placement
- If patient receiving IV/IO magnesium prearrest, stop magnesium and give IV/IO calcium chloride 10 mL in 10% solution, or calcium gluconate 30 mL in 10% solution
- Continue all maternal resuscitative interventions (CPR, positioning, defibrillation, drugs, and fluids) during and after cesarean section

Obstetric Interventions for Patient With an Obviously Gravid Uterus*

- Perform manual left uterine displacement (LUD)—displace uterus to the patient's left to relieve aortocaval compression
- Remove both internal and external fetal monitors if present

Obstetric and neonatal teams should immediately prepare for possible emergency cesarean section

- If no ROSC by 4 minutes of resuscitative efforts, consider performing immediate emergency cesarean section
- Aim for delivery within 5 minutes of onset of resuscitative efforts

*An obviously gravid uterus is a uterus that is deemed clinically to be sufficiently large to cause aortocaval compression

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Lea

**Part 12: Cardiac Arrest in Special Situations : 2010 American He
Guidelines for Cardiopulmonary Resuscitation and Emergency Ca
Care**

Défibrillation:
DSA autorisé
Même indications
Même réglages

Subseq... ...ponders

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Circulation 2010

British Journal of Anaesthesia **87** (**2**): 237–9 (2001)

Do physiological changes in pregnancy change defibrillation energy requirements?

J. Nanson*, D. Elcock, M. Williams and C. D. Deakin

Shackleton Department of Anaesthesia, Southampton University Hospitals NHS Trust, Southampton General Hospital, Tremona Road, Southampton SO16 6YD, UK

**Corresponding author*

Resuscitation during pregnancy is uncommon, with approximately 70 deaths occurring during pregancy in the UK per annum. Physiological changes during pregnancy may affect transthoracic impedance (TTI), which determines transmyocardial current. Increased blood volume, cardiomegaly, haemodilution, changes in lung volume and changes in thoracic volume may alter impedance in ways that are difficult to predict. We measured TTI at term and after delivery once physiological changes had resolved. Mean (SD) TTI was 91.3 (15.8) Ω at term and 91.6 (11.8) Ω 6–8 weeks after delivery; the difference was not statistically significant. We conclude that current energy requirements for adult defibrillation are appropriate for use during pregnancy.

Br J Anaesth 2001; **87**: 237–9

Keywords: measurement techniques, transthoracic impedance; pregnancy; heart, defibrillation

Accepted for publication: February 13, 2001

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JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association
Lea

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Défibrillation:
DSA autorisé
Même indications
Même réglages

Adrénaline et antiartytmiques:
Même schéma

Subseq... ponders	
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Check-list des causes particulières à la grossesse

Hypovolémie/hémorragie/CIVD

- Inversion utérine
- Rupture utérine
- HPP sous estimée

Prééclampsie/éclampsie

- Etat de mal convulsif
- OAP
- Intoxication au MgSO4

Complication d'anesthésie

- IOT impossible/intubation oesophagienne
- Inhalation en VS
- Intoxication aux AL

-Rachi-anesthésie totale

Embolie pulmonaire massive

Embolie amniotique

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Guidelines for Cardiopulmonary Resuscitation and Eme
Care

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<u>Embolie pulmonaire massive</u>

<u>Embolie amniotique</u>

<u>FdR: Insuffisance rénale/oligurie</u>
Arrêt du MgSO4
CaCl2

Intralipides

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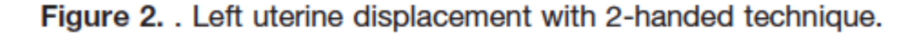

Figure 2. . Left uterine displacement with 2-handed technique.



Figure 3. Left uterine displacement using 1-handed technique.

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Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiov
Care

EXTRACTION FŒTALE
…

Subsequent Responders

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Circulation 2010

ACR et extraction fœtale…

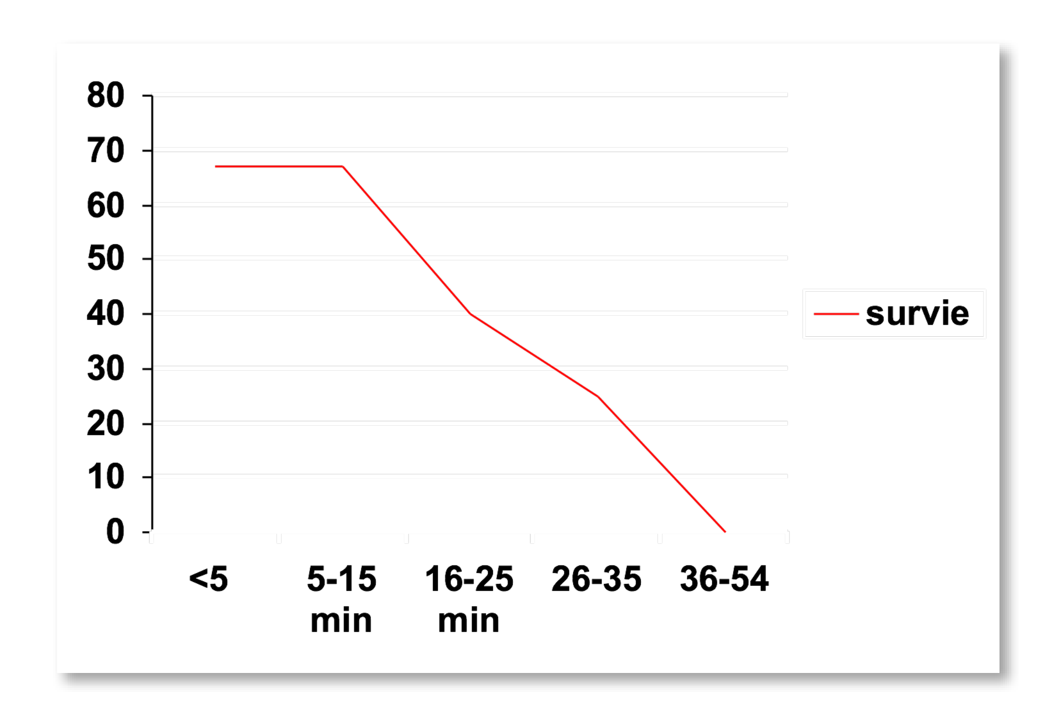


TABLE 7. ***Perimortem Cesarean Delivery With the Outcome of Surviving Infants From the Time of Maternal Death Until Delivery***

Time Interval (min)	Surviving Infants	Intact Neurologic Status of Survivors
0–5	45	98%
6–15	18	83%
16–25	9	33%
26–35	4	25%
36+	1	0%

Data from references 9 and 53.

Perimortem cesarean delivery: Were our assumptions correct?

Vern Katz, MD,[a,*] Keith Balderston, MD,[a] Melissa DeFreest, MD[b]

Table III Effect of perimortem cesarean section on maternal circulation, reported cases 1985-2004[7,9-18,22,23,27-29,33,35]

Time from maternal cardiac arrest until delivery (min)	Return of spontaneous circulation and or improvement in hemodynamic status	No change
0-5	5	2
6-10	3	—
11-15	1	—
>15	4	5
Not reported	1	1
Total	12	8

American Journal of Obstetrics and Gynecology (2005) **192**, 1916–21

ACR et extraction fœtale…

Labor Room Setting Compared With the Operating Room for Simulated Perimortem Cesarean Delivery

A Randomized Controlled Trial

Steve Lipman, MD, Kay Daniels, MD, Sheila E. Cohen, MBChB, FRCA, and Brendan Carvalho, MBBCh, FRCA

OBSTETRICS & GYNECOLOGY

VOL. 118, NO. 5, NOVEMBER 2011

Perimortem Cesarean Delivery: Its Role in Maternal Mortality

Vern L. Katz, MD*,†,‡

Semin Perinatol 36:68-72 © 2012

- Les 5 premières minutes pour la mère +++ ==> RCP
- Césarienne de sauvetage SUR PLACE
  - Au bout de 4 à 5 minutes de RCP en l'absence de RACS
  - Sans interrompre ou dégrader la qualité de la RCP

STATE-OF-THE-ART PAPER

Acute Myocardial Infarction Associated With Pregnancy

Arie Roth, MD,* Uri Elkayam, MD†

Tel Aviv, Israel; and Los Angeles, California

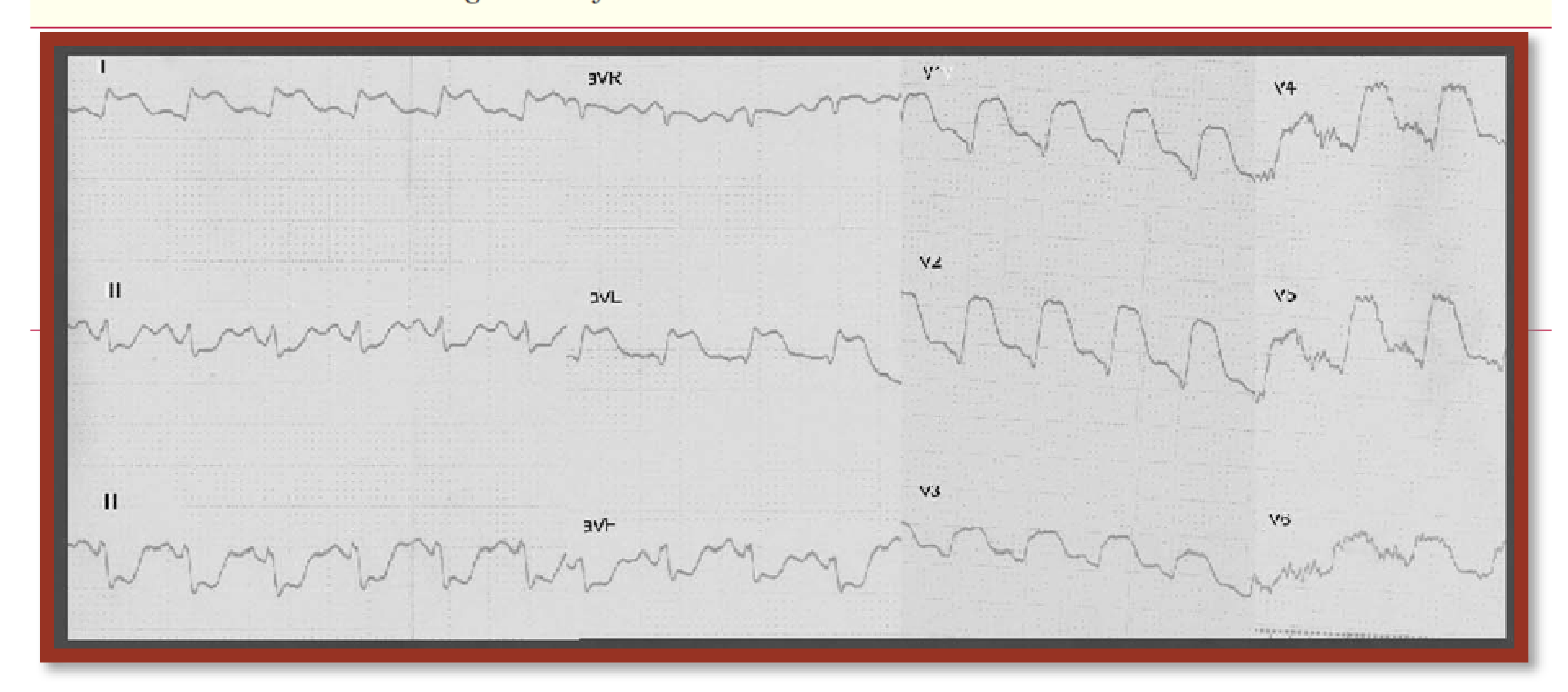
Acute myocardial infarction (AMI) during pregnancy or the early post-partum period is rare but has been shown to be associated with poor maternal as well as fetal outcome. Major changes in both diagnosis and treatment of AMI in the nonpregnant patient have lead to improved outcome which may also affect pregnant patients. The purpose of this paper is to review available information related to the pathophysiology and clinical profile and provide recommendations for the diagnosis and management of AMI occuring during pregnancy and the early post-partum period. (J Am Coll Cardiol 2008;52:171–80)

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Acute Myocardial Infarction Associated With Pregnancy

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Table 1 Select Data in 103 Pregnancies Complicated by MIs

Variable	Antepartum Group (n = 46)	Peripartum Group (n = 22)	Post-Partum Group (n = 35)	All Groups (n = 103)
Mean age ± SD, yrs	33 ± 6	32 ± 5	34 ± 5	33 ± 5
Age range, yrs	19–45	24–44	22–43	19–44
Anterior MI location, n/n (%)	30/41 (73)	16/22 (73)	27/31 (87)	73/94 (78)
Multiparous, n/n (%)	27/37 (73)	6/13 (46)	19/29 (66)	53/80 (66)
Hypertension, %	18	15	11	15
Diabetes mellitus, %	13	10	11	11
Smoking, %	62	15	43	45
Family history of MI, %	33	5	18	22
Hyperlipidemia, %	23	15	32	24
Pre-eclampsia, %	2	7	9	6
Congestive heart failure or cardiogenic shock after MI, n (%)	2 (4)	3 (14)	4 (11)	9 (9)
Coronary anatomy available, n (%)	41 (89)	21 (95)	34 (97)	96 (93)
Stenosis	25 (54)	6 (27)	10 (29)	41 (40)
Dissection	5 (11)	11 (50)	12 (34)	28 (27)
Thrombus	2 (4)	1 (5)	5 (14)	8 (8)
Spasm	1 (2)	0	1 (3)	2 (2)
Embolus	2 (4)	0	0	2 (2)
Normal	6 (13)	3 (14)	4 (11)	13 (13)
Deaths, n (%)				
Mother	4 (9)	4 (18)	3 (9)	11 (11)
Infant	5 (11)	1 (5)	—	6 (9)*

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Spécificité liés à la grossesse

- *Diagnostic:*
  - Peu de différence
  - CPK-MB élevés en postpartum (non spécifique)
  - Troponine I spécifique
    - Normale en postpartum
    - Faiblement élevée en cas de PE et HTA
    - Elevé en cas de choc hémorragique du postpartum (*Anesthesiology 2001*)
  - Nouveaux marqueurs non évalués
  - Coronarographie diagnostique possible, d'autant plus que la grossesse est avancée

Spécificité liés à la grossesse

- ***Revascularisation:***
  - Angioplastie transluminale:
    - Réalisable pendant la grossesse
    - Plus fort risque de dissection
    - Privilégier les stents nus (arrêt plavix)
  - Pontage aorto-coronarien
    - Assez peu de cas en pré partum ou données très incomplètes
    - Risque de MFIU possiblement élevé
  - ***Thrombolyse de l'IDM***
    - Peu de cas également. Surtout AVC, thrombose valvulaire et EP
    - rTPA passe peu la BFP => Pas de fibrinolyse fœtale
    - CC publiés couronnés de succès
    - Complications hémorragique

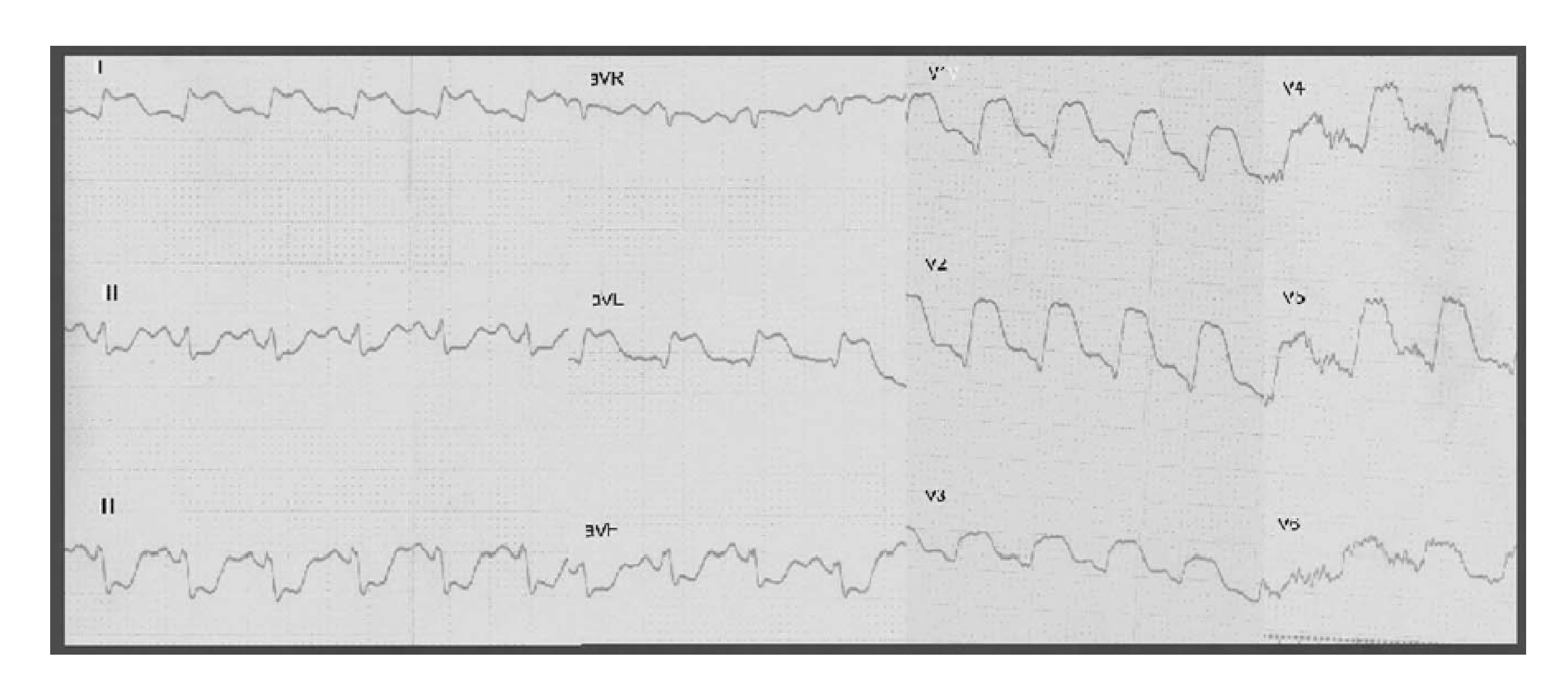
Spécificité liés à la grossesse

Privilégier l’ATL +++
Surtout en péri-partum

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    - Plus fort risque de dissection
    - Privilégier les stents nus (arrêt pla
  - Pontage aorto-coronarien
    - Assez peu de cas en pré partu données très incomplettes
    - Risque de MFIU possiblem élevé
  - ***Thrombolyse de l’IDM***
    - Peu de cas également urtout AVC, thrombose valvulaire et EP
    - rTPA passe peu la FP => Pas de fibrinolyse fœtale
    - CC publiés cou nnés de succès
    - Complications hémorragique

Successful Primary Percutaneous Coronary Intervention in the First Trimester of Pregnancy

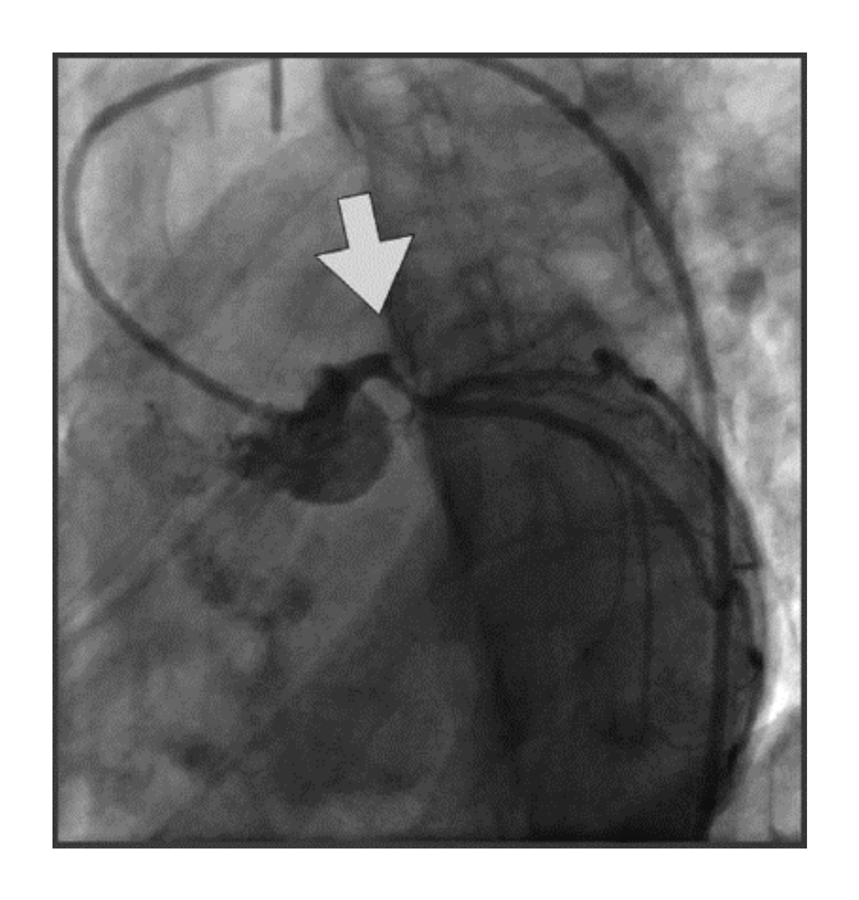
Zdravko Babic,* MD, PHD, Ivo Darko Gabric, MD, and Hrvoje Pintaric, MD, PHD

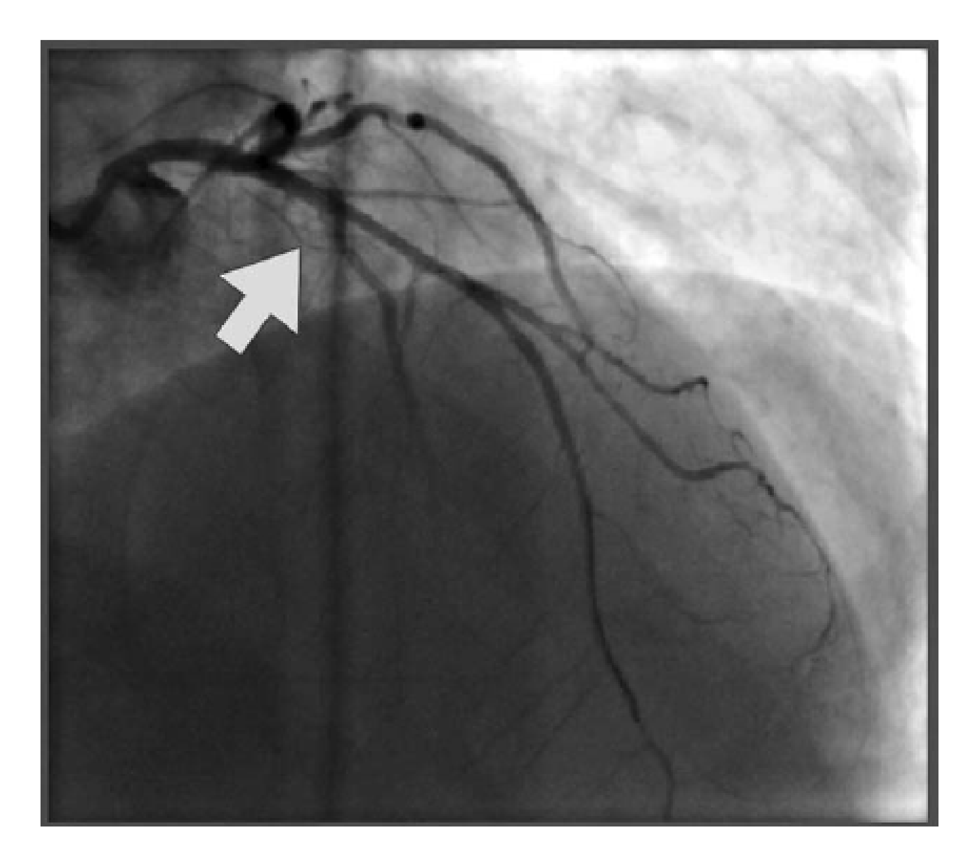


Catheterization and Cardiovascular Interventions 77:522–525 (2011)

Successful Primary Percutaneous Coronary Intervention in the First Trimester of Pregnancy

Zdravko Babic,* MD, PHD, Ivo Darko Gabric, MD, and Hrvoje Pintaric, MD, PHD





Catheterization and Cardiovascular Interventions 77:522–525 (2011)

Spécificité liés à la grossesse

- *Médicaments:*
  - Dérivés nitrés et anticalciques:
    - Utilisés dans la PE et dans la MAP
    - Eviter l'hypotension
  - Béta bloquants:
    - Pas de contre indication
    - Surveillance néonatale (glycémie, FC)
  - IEC et ARA2:
    - Déconseillés au premier trimestre (manque de données)
    - Contre indiqués au 2eme et 3eme trimestres (néphrotoxicité)
    - Allaitement possible avec IEC (passage dans le lait < 1%)
    - Peu de données suffisantes avec les ARA2
  - Statines:
    - Contre indiquées pour le moment

Statines et grossesse

- Insuffisance de donnée pour statuer
- Cas d'exposition au premier trimestre rassurants
- Conseillé de les arrêter en cas de grossesse en tant qu'hypolipémiants
- Discussion sur leur intérêt en tant que protecteurs vasculaires dans la pré éclampsie..

Statins and Pregnancy: Between Supposed Risks and Theoretical Benefits

Lecarpentier, Edouard[1]; Morel, Olivier[2]; Fournier, Thierry[3]; Elefant, Elisabeth[4]; Chavatte-Palmer, Pascale[5 6]; Tsatsaris, Vassilis[1 3 6]

16 April 2012 - Volume 72 - Issue 6 - pp 773-788



Antiagrégants plaquettaires

- Aspirine
  - Aucun problème à petite dose
  - Formellement contre-indiquée à plus de 500 mg
    - Toxicité cardiaque et rénale
    - Fermeture du canal artériel
- Clopidogrel (PLAVIX®)
  - Très peu de données
  - Contre indique l'ALR
  - Le moins possible (1 mois)
  - Arrêter une semaine avant l'accouchement
- Anti GPIIbIIIa (Rhéopro®): Pas de donnée



□ CASE REPORT □

Clopidogrel Treatment during Pregnancy: A Case Report and a Review of Literature

Marco De Santis, Carmen De Luca, Ilenia Mappa, Elena Cesari, Andrea Mazza, Tomasella Quattrocchi and Alessandro Caruso

(Intern Med 50: 1769-1773, 2011)



□ CASE REPORT □

Clopidogrel Treatment during Pregnancy: A Case Report and a Review of Literature

Auteur	*Indication*	*Terme*	*Évolution maternelle*	*Evolution foetale*
Klinzing 2001	IDM, PAC	Preconception	Survie	AVB 41 SA, Indemne
Llinares Tello 2007	IDM	11 SA	Survie	CS 38 SA, Indemne
Al-Aqueedi 2008	IDM, ATL	8 SA	Survie	CS 36 SA (ARCF), Indemne
Santiago-Diaz 2009	IDM, ATL	6 SA	Survie	CS 41 SA PFO, IM modérée
Shah 2004	SCA ST-, dissection coronaire ATL, PAC	26 SA	Insuffisance cardiaque	MFIU 26 SA post PAC
Martin 2003	IDM, ATL	6 mois	Survie	Indemne
Nallamothus 2005	IDM, ATL	34 SA	FV, CEE, Survie	AVB 34 SA, Indemne
Balmain 2008	IDM, ATL	33 SA	FV	CS 29 SA, Indemne
Boztosun 2008	IDM, ATL	20 SA	Survie	Pas de complication
Arimura 2009	IDM, ATL	21 SA	Survie	CS 32 SA, Indemne

Antiarythmiques

Table 2. Effect of Antiarrhythmics in Pregnancy[35]

Class	Maternal effect	Fetoplacental effect	Safety profile	Indication
Class Ia				
Quinidine	Oxytocin-like effects, depresses pseudocholinesterase activity (60%), potentiates the effect of ester local anesthetics	Thrombocytopenia; 8th nerve toxicity	C	SVT
Procainamide	Lupus-like syndrome	Good safety profile	C	SVT/VT
Disopyramide	Oxytocin-like effects, promotes uterine contractions	No adverse effects in fetus	C	SVT
Class Ib				
Lidocaine	Neurological and cardiovascular toxicity in large doses	Ion trapping in the fetus	B	VT
Mexiletine	Nausea, vomiting, dizziness, tremor	Fetal bradycardia, neonatal hypoglycemia, small for gestational age, low Apgar scores	C	VT
Tocainide	Nausea, vomiting, tremor, paresthesias, confusion, frank psychosis, increased liver enzymes, lupus like syndrome, agranulocytosis		C	VT
Class Ic				
Flecainide	Mild side effects	No adverse effects	C	SVT
Class II				
β-Blockers	Increased uterine tone	Fetal bradycardia, IUGR, Neonatal hypoglycemia, apnea	C	SVT/VT
Class III				
Amiodarone	Hypothyroidism	Fetal hypothyroidism small for gestation, prematurity, neurodevelopmental problems	D	
Sotalol	Bradycardia	Relatively better safety profile	B	SVT/VT
Class IV				
Ca^{2+}-channel blockers	Hypotension, uterine atony, enhances effect of magnesium, cardiac depression	No adverse effects reported	C	SVT
Miscellaneous				
Digoxin	Close maternal monitoring to prevent toxicity	Safe extensive experience; low birth weight reported.	C	SVT
Adenosine	Chest pressure, dizziness, headache	Limited data; lack of teratogenic or adverse side effects; occasional fetal bradycardia reported	C	SVT

Food and Drug Administration Drug Risk Classification: A, Controlled studies show no risk; B, No evidence of risk, either animal studies show risk, but humans do not, or animal studies do not show risk and no adequate human studies; C, Studies in pregnant women are lacking and animal studies are positive or lacking; D, Positive evidence for risk.

SVT = supraventricular tachycardia; VT = ventricular tachycardia; IUGR = Intrauterine Growth Retardation.

Globalement C

Amiodarone D

Sotalol B

(Anesth Analg 2009;108:777-85)

Thrombose veineuse profonde
Thrombophlébite cérébrale
Embolie pulmonaire

Examens radiologiques

- ***Radiations ionisantes:***
  - Dose au niveau du fœtus recommandée < 100 mGy
  - Probablement pas de pb < 300 mGy
  - Examens courants délivre des doses très très inférieures
  - > 500 mGy:
    - Retards mentaux 80%
    - Microcéphalie 20%
    - Période dangereuse 8-15 SA
  - Problème des doses cumulées +++
  - Utérus hors du champs d'irradiation
    - Pas de contre indication
    - Tablier de plomb
  - Utérus dans le champs
    - Préférer IRM ou echo si possible
    - Techniques de diminution des doses
    - Importance du terme

Examens radiologiques

- IRM
  - Peu de données au premier trimestre mais pas d’inquiétude
  - Aucun problème au 2eme et 3eme trimestres
  - Pas de contre indication quelque soit le terme
- Gadolinium
  - très peu de données
  - Objet de discussions dans le monde radiologique
  - Possible si bénéfice réel
- Produits de contraste iodés
  - Pas de contre indication
  - Risque d’hypothyroïdie de toute façon dépistée à la naissance



Page I. Wang[1]
Suzanne T. Chong[2]
Ania Z. Kielar[3]
Aine M. Kelly[4]
Ursula D. Knoepp[2]
Michael B. Mazza[2]
Mitchell M. Goodsitt[5]

Imaging of Pregnant and Lactating Patients: Part 2, Evidence-Based Review and Recommendations

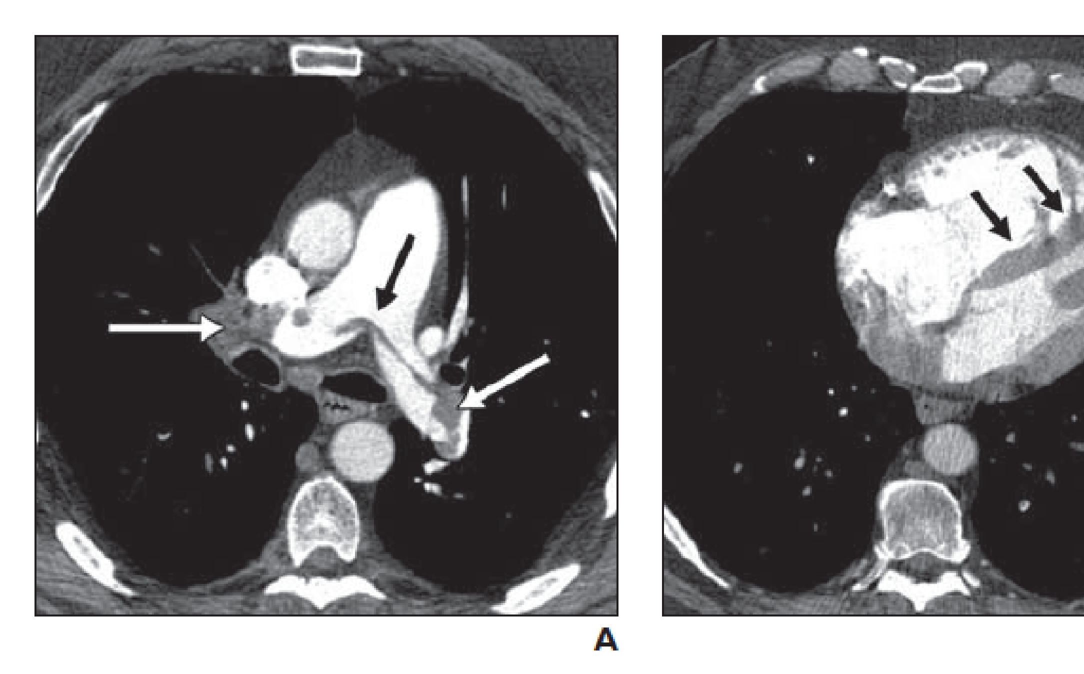


Fig. 1—22-year-old woman who is in 18th week of pregnancy and has acute onset shortness of breath, hypoxia, and tachycardia.
A, Axial pulmonary CT image shows filling defects in main, right, and left pulmonary arteries, consistent with saddle pulmonary emboli (*arrows*).
B, Axial pulmonary CT image shows straightening of interventricular septum, which suggests elevation of right-heart pressure indicating right-heart strain (*arrows*).

Am J Roentgenology Avril 2012



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Imaging of Pregnant and Lactating Patients: Part 2, Evidence-Based Review and Recommendations

TABLE 1: Radiation Exposure of Various Imaging Examinations Performed for Pulmonary Embolism

Examination	Effective Whole-Body Dose (mSv)	Fetal Dose (mGy)	Effective Dose per Breast (mGy)
Posteroanterior or lateral chest radiography	0.06–0.25	0.01	
Low-dose perfusion scintigraphy	0.6–1.0	0.1–0.37	0.11–0.3
Ventilation-perfusion scintigraphy	1.2–6.8	0.1–0.8	0.22–0.28
Pulmonary CT angiography	2–20	0.01–0.66[a]	10–70
Low-dose pulmonary CT angiography	2.7		
Pulmonary digital subtraction angiography	3.2–30.1	0.5	
Evaluation of background radiation	2.5	1.1–2.5	

Note—Variation in reported doses is largely related to CT settings, number of CT detectors, trimester, patient age, body mass index, and method of dose calculation. (Reprinted with permission from [7])
[a]Data from Winer-Muram et al. [24] not included due to outdated CT parameters and generation of CT scanner used in the study.

Rappel: Objectif < 100 mGy

Am J Roentgenology Avril 2012

Anticoagulants

Review www.AJOG.org

OBSTETRICS

Antithrombotic therapy and pregnancy: consensus report and recommendations for prevention and treatment of venous thromboembolism and adverse pregnancy outcomes

AJOG American Journal of Obstetrics & Gynecology

2007

TABLE 5
Heparin administration to prevent APO

Author	N	Drug	Patients studied	Outcome
Riyazi et al[133]	26	Nadroparin + ASA 80 mg	Thrombophilia plus prior preeclampsia or IUGR	Treatment associated with lower rates of preeclampsia/IUGR compared with historical control
Brenner et al[134]	50	Enoxaparin	Thrombophilia plus recurrent fetal loss	Treatment associated with higher live birth rate compared with historical control (75% vs 20%)
Ogueh et al[135]	24	UFH	Thrombophilia plus IUGR or abruption	No improvement compared with historical control.
Kupferminc et al[136]	33	Enoxaparin + ASA 100 mg	Thrombophilia plus preeclampsia or IUGR	Higher birth weight and gestational age at delivery compared with previous untreated complicated pregnancies.
Grandone et al[137]	25	UFH or enoxaparin	Thrombophilia plus APO/	Treatment was associated with lower rates of APO in treated (10%) vs nontreated (93%) patients.
Brenner[138]	183	Enoxaparin	Thrombophilia plus recurrent fetal loss	Treatment was associated with increased rate of live birth, and decreased rate of preeclampsia and abruption compared with historical control.
Paidas et al[139]	41	Enoxaparin, dalteparin, or UFH	Thrombophilia plus APO	~80% risk reduction in APO compared with untreated pregnancies.
Gris et al[114]	160	Enoxaparin or aspirin	Thrombophilia plus unexplained fetal loss	Enoxaparin was associated with higher live birth rates (86%) compared with aspirin (29%).

REVIEW www.AJOG.org

OBSTETRICS

Antithrombotic therapy and pregnancy: consensus report and recommendations for prevention and treatment of venous thromboembolism and adverse pregnancy outcomes

AJOG American Journal of Obstetrics & Gynecology

2007

- HNF, HBPM et le Fondaparinux ne passent pas la barrière placentaire
- HBPM préférés en traitement prophylactique ou curatif
  - Beaucoup de recul clinique
  - Molécule la plus utilisée: enoxaparine (LOVENOX®)
  - Plutôt plus efficaces avec moins de complications hémorragiques
  - Moins de TIH (1 seul cas publié pendant ma grossesse)
  - Moins d'ostéoporose
- Privilégier deux injections
- Monitorage +++ car modifications pharmacocinétiques
  - Volume de distribution augmenté
  - Filtration glomérulaire augmentée
  - Augmentation des doses pour certains
- Relais par HNF possible en situation instable
- En cas de TIH ….

Anti-factor Xa Plasma Levels in Pregnant Women Receiving Low Molecular Weight Heparin Thromboprophylaxis

Nathan S. Fox, MD, S. Katherine Laughon, MD, MS, Samuel D. Bender, MD, Daniel H. Saltzman, MD, and Andrei Rebarber, MD



Table 2. Proportion of Anti-Factor Xa Levels in Prophylactic Range by Trimester

Range (units/mL)	Total (N=321)	0–11.9 wk (n=52)	12–23.9 wk (n=129)	24+ wk (n=140)	*P*
Prophylactic (0.2–0.4)	59	50	60	62	.394
Subprophylactic (less than 0.02)	26	35	21	27	.193
Supraprophylactic (more than 0.4)	15	15	19	11	.226

Data are %.

Table 3. Proportion of Anti-Factor Xa Levels in Prophylactic Range, Stratified by Body Mass Index

Range (units/mL)	Normal Weight (BMI Less Than 25) (n=121)	Overweight (BMI 25–29.9) (n=108)	Obese (BMI 30 or More) (n=81)	*P*
Prophylactic (0.2–0.4)	63	53	67	.251
Subprophylactic (less than 0.02)	20	32	25	.186
Supraprophylactic (more than 0.4)	17	15	8	.207

BMI, body mass index.
Data are %.

Fibrinolyse …

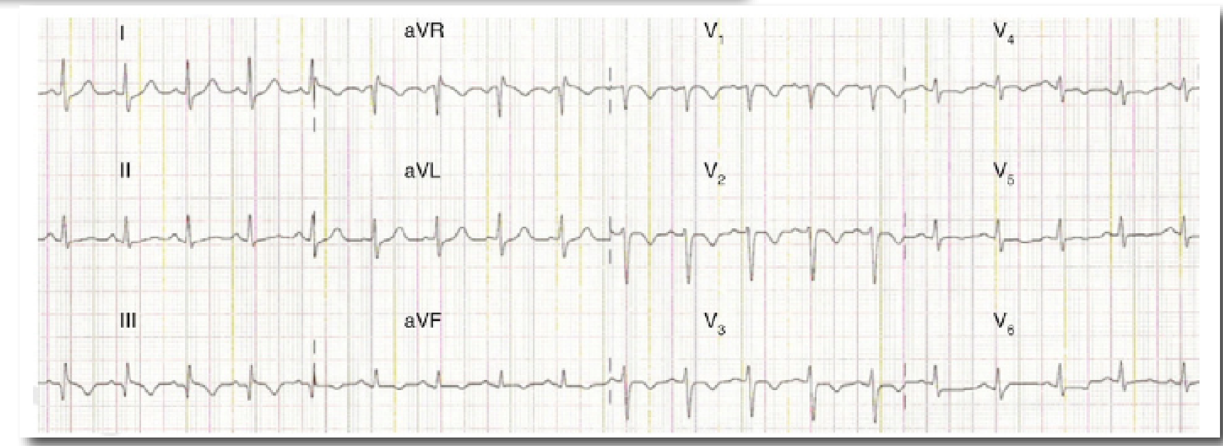
Pregnancy and acute pulmonary embolism: A case report☆

Luís Ferreira dos Santos[a,*,d], Cláudia Andrade[b,d], Bruno Rodrigues[a], Davide Moreira[a], Anne Delgado[a], Pedro Manso[b], António Pipa[b], Pedro Gama[a], Luís Nunes[a], Odete Dionísio[a], Nuno Ribeiro[c], Oliveira Santos[a]

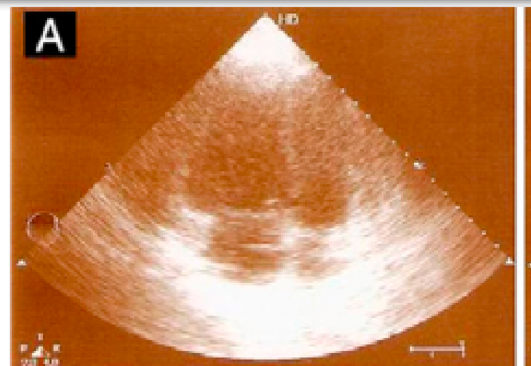
Rev Port Cardiol. 2012;31(5):389–394

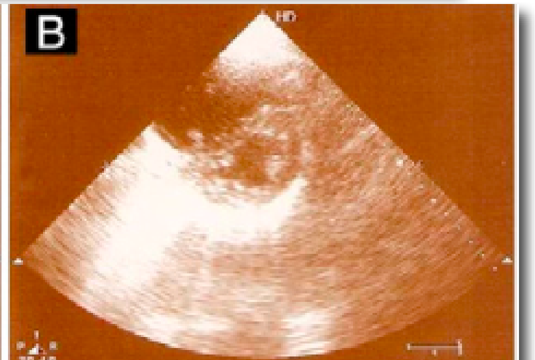


S1Q3

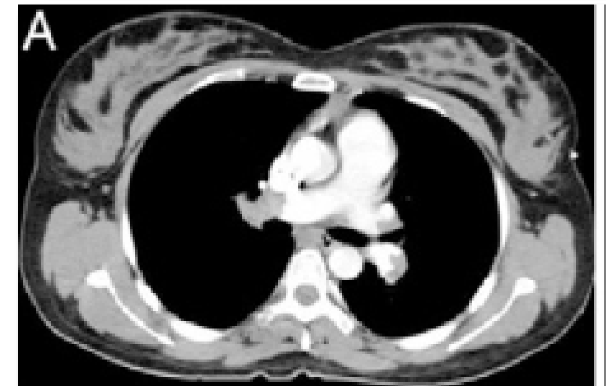


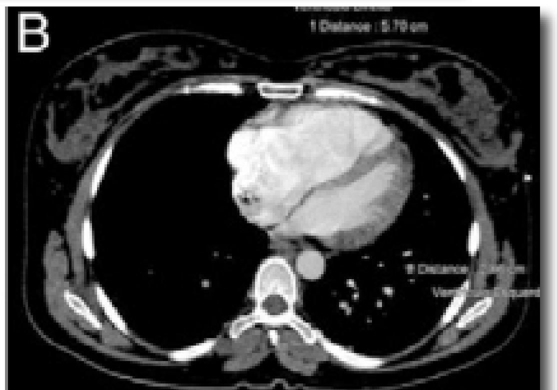
VD/VG > 1





EP proximale

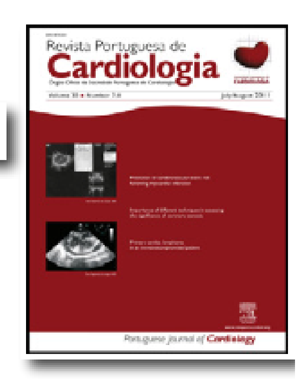




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Rev Port Cardiol. 2012;31(5):389–394



Après fibrinolyse

A

B

Disparition du S1Q3

VD/VG > 1

CASE REPORT Open Access

Thrombolysis for massive pulmonary embolism in pregnancy: a case report

Sergio Fasullo[1], Giorgio Maringhini[1], Gabriella Terrazzino[1,2], Filippo Ganci[1], Salvatore Paterna[2] and Pietro Di Pasquale[1*]

Table 1 Clinical and laboratory parameters in the first 72 h after admission.

	Entry	2 h	72 h
BP mmHg	70/50	95/60	110/70
HR beats/min	125	98	82
OS (6 L/min O2)	80%	98 (6 L/min O_2)	99% room air
RR breaths/min	28-30	22	16
pH	7.29	7.39	7.44
PO_2 mmHg	51	95	99
PCO_2 mmHg	30	34	40
HCO_3 mmol/L	20	23	24
ECG	S1-Q3-T3		Disappeared
TNI pg/mL	3.7		< 0.02
BNP pg/mL	375		< 100

BP, blood pressure; HR, heart rate; OS, oxygen saturation; RR, respiratory rate.

Alteplase (ACTILYSE®)
-10 mg IVL
-90 mg en 2 H PSE

Fasullo *et al. International Journal of Emergency Medicine* 2011, **4**:69
http://www.intjem.com/content/4/1/69

International Journal of Emergency Medicine
a SpringerOpen Journal

REVIEW www.AJOG.org

AJOG American Journal of Obstetrics & Gynecology

OBSTETRICS

Antithrombotic therapy and pregnancy: consensus report and recommendations for prevention and treatment of venous thromboembolism and adverse pregnancy outcomes

2007

- Thrombolyse…
  - Pas d'études
  - Pas mal de cas cliniques rapportés (EP, thrombose de valves,…)
    - Fibrinolyse systémiques ou sur KT
    - Efficace
    - Peu de complications
  - Risque réel inconnu. Biais de publication +++
  - A discuter en cas de menace vitale maternelle réelle
  - A mettre en concurrence avec deux alternatives:
    - Embolectomie
    - CEC

Asthme et grossesse

- Grossesse: **En fait, traiter normalement**
  - Cause d'exacerbation de l'asthme
  - Relation entre la sévérité de l'asthme et le devenir de la grossesse
  - Béta mimétiques de courte et longue durée d'action autorisés
    - Salbutamol (VENTOLLINE®) et Terbutaline (BRICANYL®)
    - Attention à la voie IV (Tachycardie, OAP)
    - Fometerol (FORADIL®) et Salmeterol (SEREVENT®)
  - Anticholinergiques
    - Bromure d'Ipratropium (ATROVENT®)
    - Possible en deuxième intension

Corticoïdes

– Corticoïdes inhalés globalement sans effets secondaires

Inhaled Glucocorticoids during Pregnancy and Offspring Pediatric Diseases

A National Cohort Study

Marion Tegethoff[1,2], Naomi Greene[3], Jørn Olsen[3,4], Emmanuel Schaffner[5,6], and Gunther Meinlschmidt[2,7,8]

TABLE 2. COX REGRESSION MODELS OF OFFSPRING DISEASES PREDICTED BY GLUCOCORTICOID INHALATION DURING PREGNANCY*

ICD-10 Category	No. of Children with a Diagnosis	Crude HR (*95% CI*)†	*P*	Adjusted HR (*95% CI*)‡	*P*
1. Infections, parasitic diseases	565	0.97 (0.81–1.16)	0.746	0.91 (0.75–1.11)	0.361
2. Neoplasms	41	0.56 (0.26–1.21)	0.141	0.54 (0.25–1.17)	0.118
3. Diseases of blood, immune system	29	1.63 (0.78–3.43)	0.193	1.54 (0.69–3.41)	0.290
4. Endocrine, metabolic disorders	93	1.54 (1.01–2.34)	0.045	1.62 (1.03–2.54)	0.036
5. Mental disorders	44	1.31 (0.71–2.42)	0.382	1.31 (0.71–2.44)	0.392
6. Diseases of nervous system	116	0.80 (0.53–1.22)	0.302	0.79 (0.51–1.23)	0.296
7. Diseases of eye	107	0.86 (0.56–1.32)	0.490	0.80 (0.52–1.23)	0.317
8. Diseases of ear	361	1.05 (0.84–1.31)	0.685	1.08 (0.86–1.37)	0.499
9. Diseases of circulatory system	26	1.23 (0.55–2.75)	0.618	1.35 (0.62–2.97)	0.453
10. Diseases of respiratory system	1,075	1.06 (0.93–1.21)	0.385	1.05 (0.91–1.20)	0.501
11. Diseases of digestive system	302	1.24 (0.98–1.58)	0.070	1.26 (0.98–1.63)	0.077
12. Diseases of skin	212	1.07 (0.80–1.43)	0.654	1.00 (0.73–1.38)	0.976
13. Diseases of musculoskeletal system	199	1.07 (0.80–1.45)	0.639	1.02 (0.74–1.40)	0.919
14. Diseases of genitourinary system	156	1.09 (0.78–1.53)	0.611	1.01 (0.71–1.44)	0.955
Any	2,443	1.03 (0.95–1.12)	0.437	1.05 (0.96–1.15)	0.242

Definition of abbreviations: CI = confidence interval; HR = hazard ratio; ICD-10 = International Classification of Diseases–10th revision.

Am J Respir Crit Care Med Vol 185, Iss. 5, pp 557–563, Mar 1, 2012

Corticoïdes

- Corticoïdes inhalés globalement sans effets secondaires
- Corticoïdes généraux moins anodins mais à prescrire si indiqué
- Risque de sevrage > risque de préscription
  - Risque de fentes faciales non retenu
  - Retard de croissance et petits poids de naissance (traitement ou pathologie sous jacente ?)
  - Préférer les molécules métabolisées par le placenta:
    - Prednisone (CORTANCYL®),
    - Prednisolone (SOLUPRED®)
    - Methylprednisone (SOLUMEDROL®)
  - Effet faible sur la surrénale fœtale si traitement chronique
  - Possible si introduction en fin de grossesse à forte dose et de façon prolongée
- Sevrage thérapeutique ==> AAG

Epilepsie/EME

- Toujours penser à l'éclampsie
- Le plus dangereux est une épilepsie mal équilibrée
- Risques:
  - Tératogénicité
  - Développement psychomoteur
- Valproate de Na (DEPAKINE®)
  - franchement tératogène (polymalformatif)
  - Troubles psycho-comportementaux. Baisse du QI.
- Anti-épileptique les moins dangereux:
  - **BZD (RIVOTRIL®)** en traitement de la crise
  - LAMICTAL® a donner en première intention (énormément de données)
  - **KEPPRA®,** TRILEPTAL®. Données très nombreuses et rassurantes sur les malformations et le troubles du comportement
  - **PRODILANTIN®,** DI-HYDAN®, NEURONTIN®, TEGRETOL®. Données très nombreuses également sur l'absence de malformations. Moins de données sur le développement psychomoteur.
- Anti-epilleptique acceptable en l'absence d'alternative
  - ZARONTIN
  - GARDENAL et autres barbituriques
  - LYRICA
  - SABRIL
  - …

Epilepsie/EME

- Toujours penser à l'éclampsie
- Le plus dangereux est une épilepsie mal équilibrée
- Risques:
  - Tératogénicité
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- Anti-epilleptique acceptable en l'absence d'alternative
  - ZARONTIN
  - GARDENAL et autres barbituriques
  - LYRICA
  - SABRIL
  - …

EME
Traitement habituel
Attention difficultés IOT

Antibiotic chemotherapy during pregnancy and lactation period: aspects for consideration

Arch Gynecol Obstet (2011) 283:7–18

Ioannis Mylonas

GYNECOLOGY AND OBSTETRICS

Classe	*Remarques*	*Utilisabilité*
Pénicillines, Céphalosporines	Allergie	Première intention
Macrolides	Très utilisé en France (toxo) Une étude Suédoise (malformations ?)	Première intension Allergie Béta lactamines
Clindamycine	Colite pseudo-membraneuse	Utilisable
Aminosides	Ototoxicité (+++ 4 premiers mois) Pas de néphrotoxicité !!!	Utilisable si infection grave Cure courte - taux résiduels
Métronidazole, Ornitazole	Beaucoup de recul avec le métronidazole	Utilisable - Préférer le Métronidazole +++
Sulfamides, Co-Trimoxazole	Malformations (tubes neurale, cœur) Effet antifolique surtout à forte dose	Si indispensable avant 10 SA (Pneumocystose) Suplémentation folate
Vancomycine, Teicoplanine	Peu d'info	Autorisé si SDMR
Tétracyclines	Hépatites maternelles - Toxicité dentaire foetale	Interdit
Fluoroquinolones	Toxicité cartilagineuse chez l'animal	Préférer la Ciprofloxacine ou la lévofloxacine
Antitubrculeux	Isoniazide OK + Vit B6 Rifampicine OK + Vit K1 Ethambutol OK Pyrazinamide OK	Importance d'un traitement optimal de la tuberculose pendant ma grossesse (OMS)
Linezolide	Pas d'étude - Cas cliniques rassurants	Inconnu - Si SDMR Vanco-R

Sédation analgésie

- Passage trans-placentaire par diffusion (gradient de concentration/perméabilité)
- Le médicament d'anesthésie passent car ils sont de petit PM et liposolubles
- Importance de la durée d'exposition
- Curares passent très peu pas la barrière placentaire
- Beaucoup d'études en anesthésie (Césarienne sous AG ou chirurgie non obstétricale) très rassurantes.
  - Aucun effet tératogène reconnu
  - Pas de toxicité
  - Administration courte des médicaments d'induction
  - Entretient aux halogénés
- Peu de données en réanimation (sédation longue durée)
- BZD
  - Finalement très prescrite en ville avec peu de complications
  - Transposable à la sédation IVSE ?
  - Pas de risque spécifique
- Assistance respiratoire du NN si extraction

Early Exposure to Anesthesia and Learning Disabilities in a Population-based Birth Cohort

Robert T. Wilder, M.D., Ph.D., Randall P. Flick, M.D., M.P.H.,† Juraj Sprung, M.D., Ph.D.,‡ Slavica K. Katusic, M.D.,§ William J. Barbaresi, M.D.,‖ Christopher Mickelson, M.D.,# Stephen J. Gleich, M.D.,** Darrell R. Schroeder, M.S.,†† Amy L. Weaver, M.S.,†† David O. Warner, M.D.‡*

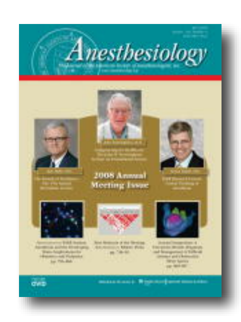


Table 6. Effects of Anesthetic Exposures before Age 4 yr on Risk for Development of Learning Disabilities

	Unadjusted			Adjusted*		
	Hazard Ratio	95% CI	*P* Value	Hazard Ratio	95% CI	*P* Value
Number of exposures			< 0.001			< 0.001
0, n = 4,764	Reference			Reference		
1, n = 449	1.05	0.84–1.32		1.00	0.79–1.27	
2, n = 100	1.78	1.22–2.59		1.59	1.06–2.37	
3 or more, n = 44	2.50	1.55–4.04		2.60	1.60–4.24	
Total duration of anesthesia exposure						
Continuous (per 30 min)	1.02	1.00–1.03	0.011	1.02	1.00–1.03	0.016
Categorical (30-min intervals)			0.004			0.027
No anesthesia, n = 4,764	Reference			Reference		
≤ 30 min, n = 95	0.93	0.56–1.55		0.94	0.56–1.60	
31–60 min, n = 135	0.80	0.51–1.26		0.74	0.46–1.20	
61–90 min, n = 135	1.50	1.06–2.14		1.40	0.97–2.02	
91–120 min, n = 87	1.45	0.94–2.24		1.36	0.89–2.10	
≥ 120 min, n = 141	1.65	1.19–2.29		1.56	1.11–2.19	
Any exposure			0.014			0.067
No, n = 4,764	Reference			Reference		
Yes, n = 593	1.27	1.05–1.53		1.20	0.99–1.46	

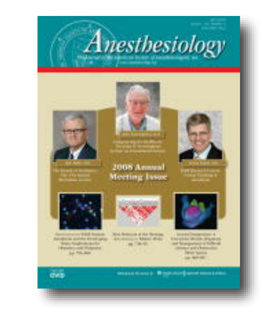
* Adjusting for sex, birth weight (< 2,500 g, ≥ 2,500 g), and gestational age (< 32 weeks, 32 to < 37 weeks, ≥ 3 7 weeks). Because of missing covariate information, only 5,020 individuals were included in the adjusted analysis.

CI = confidence interval.

Anesthesiology 2008

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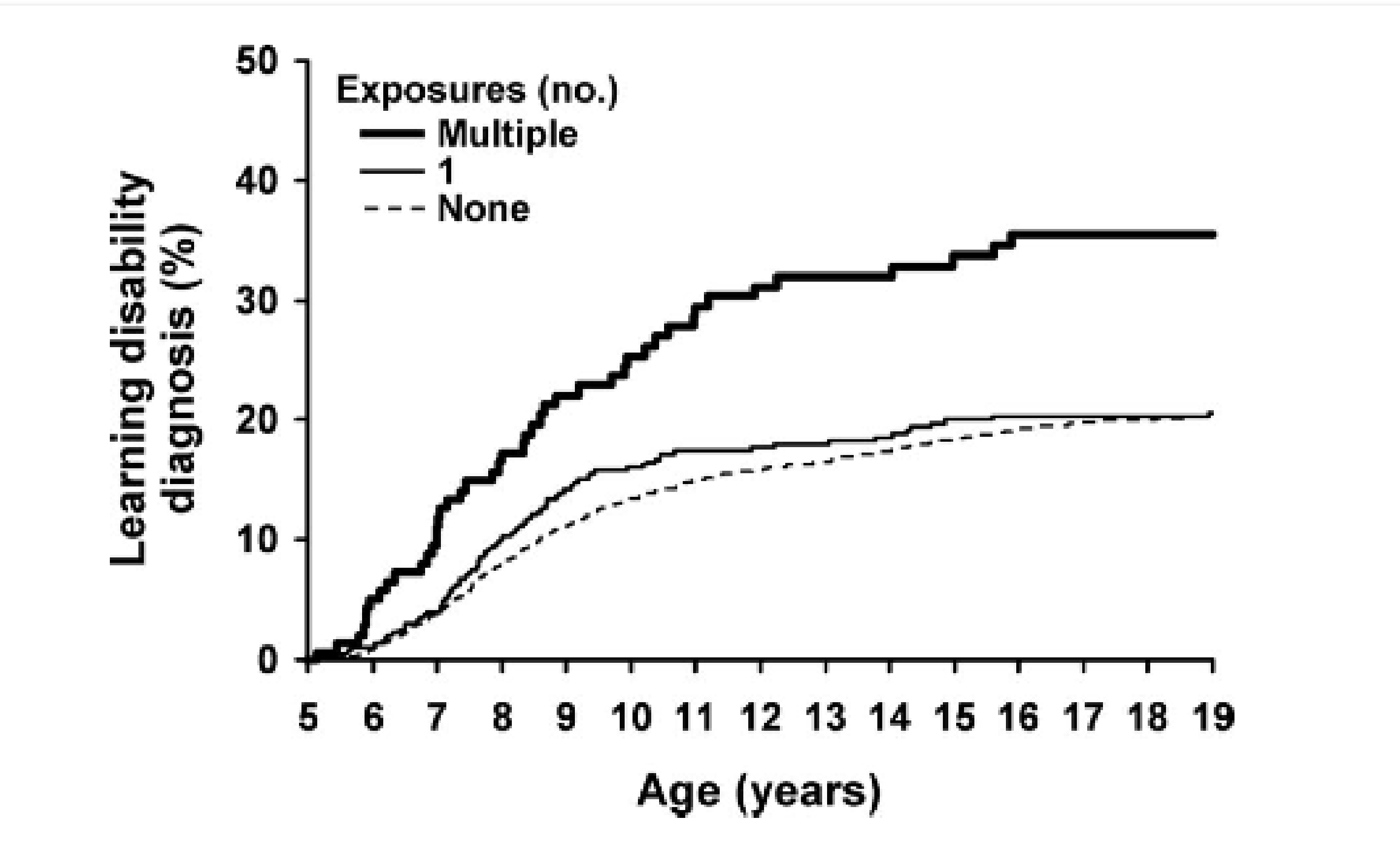
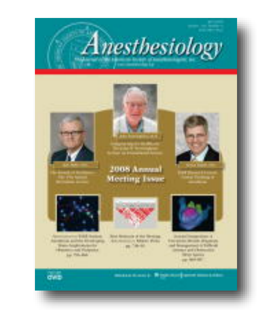


Fig. 1. Cumulative percentage of learning disabilities diagnosis by the age at exposure shown separately for those that have zero, one, or multiple anesthetic exposures before age 4 yr.

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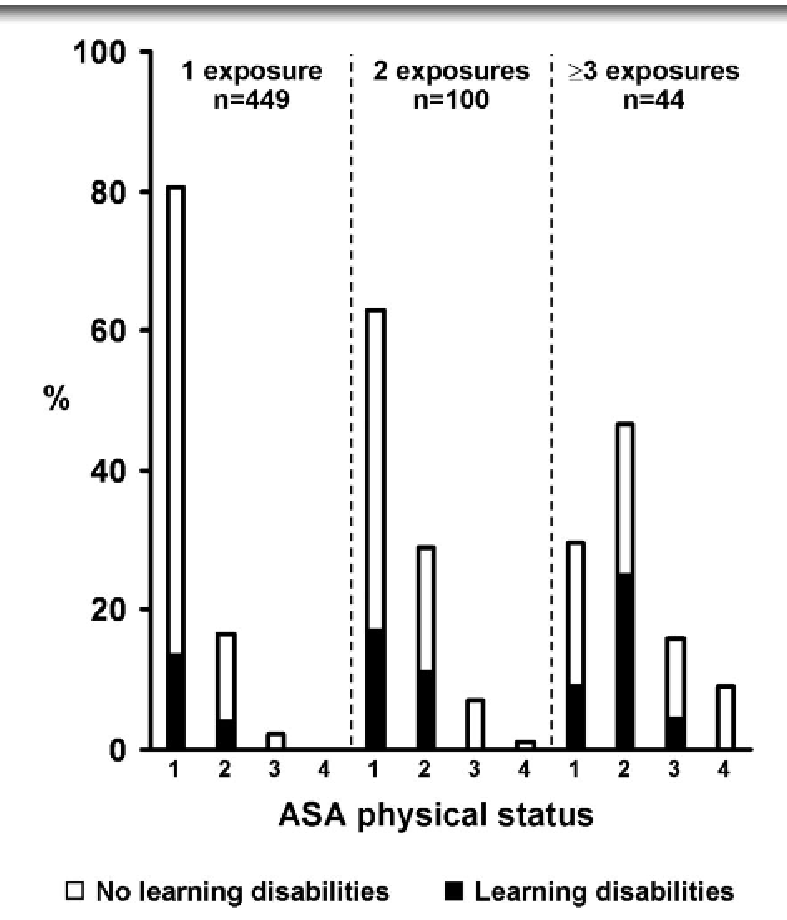


Fig. 2. Distribution of American Society of Anesthesiologists (ASA) physical status across patients with one, two, and three or more anesthetic exposures. *Shading* is used to indicate the percentage diagnosed with learning disability under age 19 yr *versus* not. For this presentation, individuals who had incomplete follow-up are categorized based on information available through last follow-up before age 19 yr.

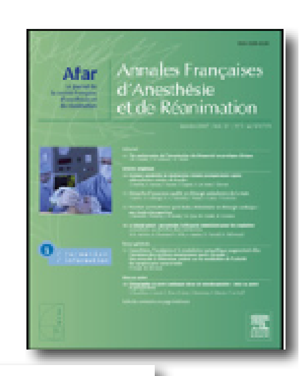
Anesthesiology 2008

Congrès de l'Adarpef

Conséquences neurologiques de la sédation en réanimation☆

Neurological consequences after long-term sedation in the ICU

S. Dahmani[a,b], F. Tourrel[c,d], T. Blanc[e], S. Marret[d,e], S. Jegou-Colleter[d], V. Laudenbach[d,e,*]



- Essentiellement:
  - Antagonistes NMDA ($N_2 0$ et kétamine)
  - Agonistes GABA (BZD, barbituriques, propofol, etomidate, halogénés)
- Modèles animaux de modification du développement nerveux a très fortes doses
  - Différence d'espèce
  - Extrapolation humaine difficile (doses)
- Etudes humaines rétrospectives biaisées
- Risque de complication plus liée à la lourdeur de la chirurgie +++
- Nécessité de sédater et de traiter la douleur en réanimation
- Prudence sur la sédation en réanimation pendant la grossesse et avant 4 ans concernant
  - Ses indications
  - Sa profondeur
  - Sa durée

Annales Française d'Anesthésie et de Réanimation 2012

Maternal and neonatal effects of bolus administration of ephedrine and phenylephrine during spinal anaesthesia for caesarean delivery: a randomised study

S. Prakash, V. Pramanik, H. Chellani, S. Salhan, A.R. Gogia
Department of Anaesthesia and Intensive Care, Vardhman Mahavir Medical College and Safdarjang Hospital, New Delhi, India

Table 3 Neonatal data

	Ephedrine (n = 30)	Phenylephrine (n = 30)	*P*
Birth weight (kg)	2.84 ± 0.40	2.88 ± 0.32	0.648
Apgar scores at 1 min	8 (7-9)	9 (8-9)	0.739
5 min	9 (7-10)	10 (8-10)	0.128
10 min	9 (8-10)	10 (8-10)	0.611
Umbilical arterial acid-base status			
pH	7.29 ± 0.04	7.32 ± 0.04	0.010
PO_2 (mmHg)	17.5 ± 2.83	18.13 ± 3.21	0.459
PCO_2 (mmHg)	44.0 ± 6.13	43.50 ± 5.29	0.751
Base excess (mEq/L)	-2.83 ± 0.94	-1.61 ± 1.04	<0.001
Umbilical venous acid-base status			
pH	7.34 ± 0.04	7.38 ± 0.05	0.002
PO_2 (mmHg)	26.5 ± 3.24	28.1 ± 3.62	0.079
PCO_2 (mmHg)	35.9 ± 5.45	36.0 ± 4.72	0.939
Base excess (mEq/L)	-1.9 ± 0.76	-1.1 ± 1.12	0.001

Values are mean ± SD or median (range).

Int J Obstet Anesthesia 2009

A Quantitative, Systematic Review of Randomized Controlled Trials of Ephedrine Versus Phenylephrine for the Management of Hypotension During Spinal Anesthesia for Cesarean Delivery

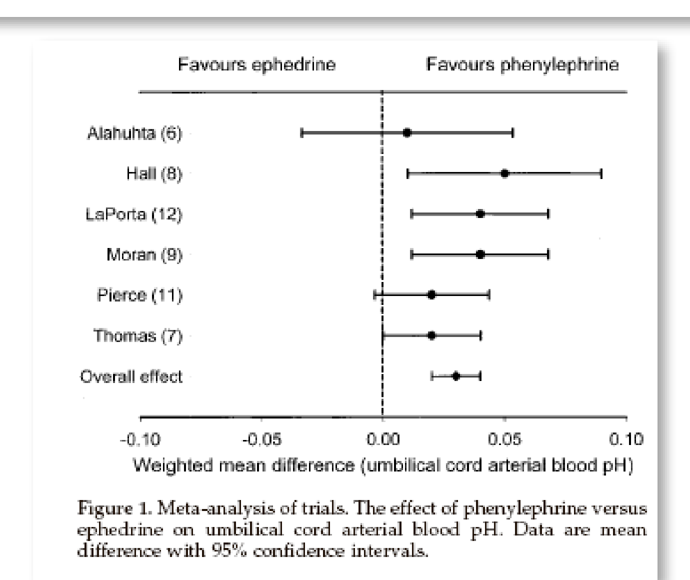


Figure 1. Meta-analysis of trials. The effect of phenylephrine versus ephedrine on umbilical cord arterial blood pH. Data are mean difference with 95% confidence intervals.

- Plus d'acidose fœtale avec l'éphédrine
- Contrôle identique de la pression artérielle (définitions différentes)
- Plus de bradycardie dans les groupes néosynéphrine répondant toutes à l'atropine
- Résultats contradictoires sur les dopplers utérine (2 études)
- APGAR identiques

Adrénaline, Noradrénaline … Pas de données
En cas d'insuffisance circulatoire aiguë, le pronostic fœtal est lié au pronostic maternel
La perfusion placentaire est pression dépendante
Pas de restriction d'utilisation des vasopresseurs
Extraction fœtale si proche du terme

Anna Lee Anesth Analg 2002

Antalgiques

CRAT
www.lecrat.org

- Paracétamol possible pendant toute la grossesse
- AINS: Inhibition de synthèse des PGs = Effet de classe
  - AINS, antiCOX-2, aspirine > 500 mg/j
  - Y compris le crème anti-inflammatoires ++++
  - Augmentation des FCS évoquée. Pas de malformation
  - *Toxicité rénale*
  - *Toxicité cardiaque (fermeture du canal artériel). Mort fœtale in utero possible même en prise unique en fin de grossesse*

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- Avant 5 mois : éviter si possible d'utiliser un AINS
- Après 5 mois (24 SA) : tous les AINS sont **contre-indiqués**
  - même en prise ponctuelle
  - y compris ceux utilisés comme antalgiques (ibuprofène : Advil®, Nurofen®…)
  - quelle que soit la voie, même cutanée (sauf oculaire car quantités minimes)

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  - Pas de données pendant la grossesse
  - A éviter
  - Préférer paracetamol et codeine

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  - A éviter
  - Préférer paracetamol et codeine
- Codéine et Tramadol autorisés
- Morphine autorisée
  - Syndrome de sevrage néonatal pour les prises chroniques et en fin de grossesse
  - Détresse respiratoire néonatale possible

Conclusion



- Principe du bénéfice/risque
- Liste de médicament formellement contre indiqués finalement assez courte
- Spécificité de la réanimation:
  - Détresse vitale maternelle
  - Pronostic fœtal lié au pronostic maternel
  - Peu de donnée sur les médicaments les plus fréquemment utilisés
    - Sédation
    - Catécholamines
  - Différencier la tératogénicité et la toxicité
  - BB non viable avant 25 SA
  - Discuter extraction à partir de 35 SA



http://www.lecrat.org